

E1
a position sensor responsive to magnetic fields for generating signals for determining position and orientation coordinates of the catheter distal end; and

a signal processor for receiving the signals from the position sensor and reconstructing a three-dimensional surface representing a surface of the patient's heart and for generating a map on the three-dimensional surface showing the sensed electrical signals generated by the heart.

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E2
Claim 83. (Three Times Amended) A method of treating a patient's heart comprising the steps of:

- (a) percutaneously inserting a catheter into a heart of a patient, the catheter having a proximal end and a distal end, an active portion at the distal end of the catheter for sensing electrical signals generated on the heart and for applying laser energy, and a position sensor responsive to magnetic fields for generating location signals;
- (b) generating magnetic fields;
- (c) using the position sensor to generate location signals based on the generated magnetic fields;
- (d) sensing the position of the catheter distal end based on the location signals generated by the position sensor for determining position and orientation coordinates of the catheter distal end at a number of places on a surface of the heart by touching the catheter distal end on the surface at each place;
- (e) using the position sensor to reference the catheter distal end based on the position and orientation coordinates;
- (f) reconstructing a three-dimensional surface representing the surface of the heart;
- (g) sensing electrical signals generated by the heart;
- (h) mapping the electrical activity of the heart on the three-dimensional surface using the sensed electrical signals;
- (i) positioning the catheter such that its distal end is adjacent tissue of the heart to be treated based on the position and orientation coordinates; and
- (j) applying laser energy from the active portion to the patient's heart tissue.